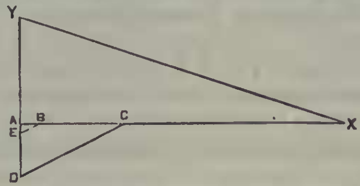
Approximate Quadrature of the Circle. *By Pliny Earle Chase, LL.D.*
(*Read before the American Philosophical Society, June 20th,* 1879.)



AB = 3 ; AC = 20
AD = 3 AB ; AX = 3 AC
BE parallel to CD
EY = AC
XY = 3.141585 AC

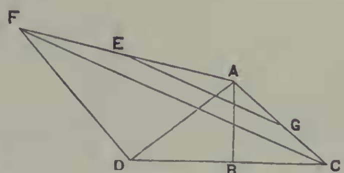
The deviation from perfect accuracy is less than $\frac{1}{4100}$ of one per cent. which would give an error of less than $\frac{1}{6}$ of an inch per mile. For all practical purposes the construction may be regarded as *exact*, for the error would be inappreciable in any mechanical work.

HAVERFORD COLLEGE, June 16th, 1879.

NOTE.—July 16, 1879. My attention has been called to the following more-complicated construction, and closer approximation, in Perkins's Geometry (D. Appleton & Co., 1853).

On an indefinite straight line A N, take A B = B D = D E = 1 ; at E erect a perpendicular E G = 2 A B = 2 E F ; on E N take E H = H K = A G, K L (towards A) = A F, L M (towards N) = D G, M N = D F ; bisect E N at P, E P at R, A B at C ; trisect E R at T. Then C T = 3.1415922.

The author calls this method "very simple," and says, that a better one "can hardly be expected, or even desired." But the approximation of Adrian Metius, $\frac{355}{113}$, is still closer, and the following construction of his ratio is simpler.



On A B = 7 erect the perpendicular B C = 8 ; extend C B to D, making B D = 9 ; on A D erect the perpendicular D F = 15 ; take A E = A C, and draw E G parallel to F C. Then $\frac{AF}{AG} = \frac{355}{113} = 3.1415929$, the true ratio being 3.1415926+.

The error of this construction is less than $\frac{1}{116000}$ of one per cent. Perkins's error is more than $\frac{1}{70000}$ of one per cent. Neither method is so simple, nor so desirable for practical purposes, as the one which I communicated to the Society at its June meeting.